* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] this invention relates to the locking device of the shift lever in the automatic transmission of vehicles, and relates to the locking device of the shift lever which has the shift lock mechanism which regulates in detail movement of the shift lever which is in the position for parking at the time of vehicles parking, and the reverse inhibit mechanism which regulates movement in the position for a go-astern (reverse) run of a shift lever during a run.
[0002]
[Description of the Prior Art] As generally shown in the automobile in which the automatic transmission (henceforth A/T) was carried at drawing 6 , the shift lever 1 for specifying the gear change position of AT is formed in the method of the forward left of a driver's seat U.
[0003] the shift pattern with which the shift lever 1 was formed in housing 2 (it illustrates to drawing 6) as shown in drawing 7 (a) -- it is arranged in the hole 3 a shift pattern -- two or more level difference sections form a hole 3 in the cross direction -- having -- **** -- a shift lever 1 -- the shift pattern -- along with each level difference section of a hole 3, it is supported possible [movement to a cross direction and a longitudinal direction] moreover, the shift lever 1 -- the time of movement -- the shift pattern -- it can switch to seven shift positions set up in the hole 3
[0004] the shift position -- a shift pattern -- the backmost part from the foremost part of a hole 3 -- continuing -- the position P for parking (parking) of vehicles, the position R for a go-astern run (reverse), the position N non-driving (neutral), the position D for an advance automatic run (drive), the position P3 for a 3 steps of advance gear change run, and the position P2 for an advance 2nd-speed run And the position P1 for an advance 1st-speed run It is.
[0005] Thus, in the prepared shift lever 1, when the shift lever 1 in the drive position D moves by the operation mistake during a vehicles run in the reverse position R, a serious shock will be given to vehicles. Then, the various reverse inhibit mechanisms for regulating conventionally that the shift lever 1 in the drive position D etc. moves during a run in the reverse position R are proposed.
[0006] Moreover, when the shift lever 1 which is in the parking position P at the time of vehicles parking is operated by unnecessary mind and switched to other positions, the lock of a driving wheel is canceled and there is a possibility that vehicles may move. Then, the various shift lock mechanisms for regulating that the shift lever 1 which is in the parking position P at the time of vehicles parking moves to other positions conventionally are proposed.
[0007] The locking device 40 which has a reverse inhibit mechanism and a shift lock mechanism in drawing 7 (b) is shown. This locking device 40 is formed in the interior of housing 2, and is equipped with the 1st lock piece 43 which a center section is supported possible [rotation] at the nose of cam of plunger 41a of a solenoid 41, and the end face section is fixed to revolve by the pivot 42 possible [rotation], and is rocked forward and backward. Moreover, the end of a link 44 is supported by the point of the 1st lock piece 43 possible [rotation], and the other end of the link 44 is connected with it possible rotation] at the end face section of the 2nd lock piece 45. The point is fixed to revolve by the pivot 46 possible [rotation] so that it may become parallel [the 2nd lock piece 45] to the 1st lock piece 43.
[0008] and when a solenoid 41 is OFF, plunger 41a projects and a solid line shows to drawing 7 (a) -- as -- the 1st lock piece 43 -- a shift pattern -- the path between the parking position P in a hole 3 and the reverse position R is closed, and movement of the shift lever 1 in the parking position P is regulated when a solenoid 41 is turned on [it], plunger 41a is absorbed and a two-dot chain line shows -- as -- the 1st lock piece 43 -- a shift pattern -- it moves outside from the inside of a hole 3, the path of a shift lever 1 is opened wide, and the movement is permitted Thus, a shift lock mechanism functions.
[0009] moreover -- the time of a solenoid 41 being OFF like [the 2nd lock piece 45] the 1st lock piece 43 -- a shift pattern -- the path between the neutral position N in a hole 3 and the reverse position R is closed, and movement of a shift lever 1 in the reverse position R is regulated from the neutral position N side if a solenoid 41 is turned on [it] -- the 2nd lock piece 45 -- the 1st lock piece 43 and link 44 -- minding -- a shift pattern -- it moves outside from the inside of a hole 3, the path of a shift lever 1 is opened wide, and the movement is permitted Thus, a reverse inhibit mechanism functions.
[0010]
[Problem(s) to be Solved by the Invention] However, in the above-mentioned locking device 40, since it has the link mechanism which consists of the 1st and 2nd lock piece 43 and 45 and links 44, composition becomes complicated. For this reason, there are many amounts of the grease with which the dimensional accuracy of each part material is applied to a low and a rotation portion, or there is a bird clapper that each part material cannot operate easily due to causes, such as deformation (when the quality of the material is synthetic resin) of each part material by the temperature change.

Consequently, there is a trouble that it cannot ** if operation by which the solenoid 41 was stabilized is obtained while the load of the solenoid 41 when moving the 1st and 2nd lock piece 43 and 45 increases.
[0011] moreover -- if a shift lever 1 is moved to the neutral position N or the parking position P from the reverse position R -- a shift lever 1 -- a shift pattern -- it moves, pushing in either of the 1st located in a hole 3, and 2nd lock piece 43 and 45 Consequently, plunger 41a will be compulsorily absorbed by external force, and a solenoid 41 will be in an ON state. For this reason, the endurance which can bear it even if compulsorily operated by the solenoid 41 is required.
[0012] Furthermore, when turning a solenoid 41 on and off, there is a trouble that the 1st and 2nd lock piece 43 and 45 and links 44 which are interlocked with it contact mutually, and generate operation sound.
[0013] while it is made in order that this invention may solve the above-mentioned trouble, and the purpose simplifies composition and reducing the load of a solenoid, a solenoid operates compulsorily by external force -- there is nothing -- further -- composition -- it is in offering the locking device of the shift lever in the automatic transmission which can lessen generating of the operation sound of a member as much as possible
[0014]
[Means for Solving the Problem] In order to solve the above-mentioned technical problem invention according to claim 1 It is supported possible [rotation] in the direction which intersects the shift lever by which change movement is carried out between the position for parking, the position for a go-astern run, a non-activation point, and the position for an advance run, and the aforementioned shift lever. in a usual state The 1st rocking object rocked so that a point may open and close the path of the aforementioned shift lever between the aforementioned non-activation point and the aforementioned position for a go-astern run, It is supported possible [rotation] in the direction which intersects the aforementioned shift lever. in a usual state The 2nd rocking object rocked so that a point may open and close the path of the aforementioned shift lever between the aforementioned position for parking, and the aforementioned position for a go-astern run, It counters with the 1st and 2nd rocking objects. it prepares near the above 1st and the 2nd rocking object -- having -- this -- The lock position which makes impossible rotation of the above 1st which contacts the shift lever in the case of movement in the aforementioned position for a go-astern run from the aforementioned non-activation point of the aforementioned shift lever or the aforementioned position for parking, and the 2nd rocking object, Let it be a summary to have had the agonist which moves between the above 1st and the 2nd rocking object, and the non-locking positions that do not counter, and the move means to which between the aforementioned lock position and the aforementioned non-locking positions is moved for the aforementioned agonist.
[0015] Invention according to claim 2 makes it a summary to equip the locking device according to claim 1 with the control means which control the aforementioned move means based on the operating state of detection of the position of the aforementioned shift lever, detection of the speed of vehicles, and the braking means of vehicles at least.
[0016] Invention according to claim 3 is set to a locking device according to claim 1 or 2. the above 1st and the 2nd rocking object The support pillar with which the end was loosely inserted in the end face section, and the slide contact child was fixed to the other end, Let it be a summary to have an energization means to energize the aforementioned slide contact child for it to fit loosely into the support pillar and make the aforementioned slide contact child's nose of cam **** at the pars basilaris ossis occipitalis of the curve wall surface prepared near the end face section of the above 1st and the 2nd rocking object.
[0017]
[Function] According to invention according to claim 1, if an agonist is moved to a lock position by the move means, the agonist will counter with the 1st and 2nd rocking objects. In this state, in case a shift lever moves to the position for a go-astern run from a non-activation point or the position for parking, in contact with an agonist, it becomes impossible the rotating either of the 1st which contacted the shift lever, and 2nd rocking objects, for example. Therefore, movement in the position for a go-astern run of a shift lever is regulated. Since either of the 1st which contacted the shift lever, and 2nd rocking objects does not contact an agonist on the contrary in case a shift lever moves to a non-activation point or the position for parking from the position for a go-astern run, the rotation is permitted.
[0018] When an agonist is moved to a non-locking position by the move means, the agonist stops countering with the 1st and 2nd rocking objects, and rotation of the 1st and 2nd rocking objects is permitted regardless of the position of a shift lever in the case of the movement. therefore -- since the 1st and 2nd rocking objects are not contacted when a move means does not operate compulsorily by external force and an agonist moves further, while the load of a move means is reduced -- composition -- generating of the operation sound of a member decreases as much as possible
[0019] According to invention according to claim 2, at least, based on the operating state of detection of the position of a shift lever, detection of the speed of vehicles, and the braking means of vehicles, control means control a move means and move between a lock position and non-locking positions for an agonist. Therefore, according to the state of vehicles, a shift lever can certainly be locked.
[0020] If according to invention according to claim 3 it is in the state where a slide contact child's nose of cam ****ed in the usual state at the pars basilaris ossis occipitalis of a curve wall surface and the 1st and 2nd rocking objects rotate, a slide contact child's nose of cam will slide on a wall surface. When rotation of the increase of the energization force of the sliding child by the energization means, the 1st, and 2nd rocking objects stops at this time as a slide contact child's nose of cam separated from the pars basilaris ossis occipitalis of a wall surface, according to the energization force, a sliding child returns to the pars basilaris ossis occipitalis of a wall surface, and the 1st and 2nd rocking objects return to the position of a basis.
[0021]
[Example] Hereafter, one example which materialized this invention is explained according to drawing 1 - drawing 5 . In addition, the sign same about the same composition as the conventional technology is attached, and the detailed explanation is omitted. Moreover, since it is the same as usual also about the shift position of a shift lever 1, the explanation is omitted.

[0022] As shown in drawing 1 , the locking device 4 is formed in housing 2, and is equipped with the 1st, the 1st as 2nd rocking object, and the 2nd lock piece 5 and 6. The 1st and 2nd lock piece 5 and 6 is cylindrically formed by the product made of synthetic resin, respectively, and each of those points 5a and 6a are formed in the shape of a triangle.
[0023] The point 5a closes the path of the shift lever 1 between the reverse position R and the neutral position N, and as the 1st lock piece 5 turns to the method of the diagonal left, it is arranged. moreover, the 1st lock piece 5 -- the -- almost -- a core -- a shift pattern -- it is supported possible [rotation] by pivot 7a perpendicularly prepared near the hole 3
[0024] The point 6a closes the path of the shift lever 1 between the parking position P and the reverse position R, and as the 2nd lock piece 6 turns to the method of the diagonally rear to the left, it is arranged. moreover, the 2nd lock piece 6 -- the -- almost -- a core -- a shift pattern -- it is supported possible [rotation] by pivot 7b perpendicularly prepared near the hole 3
[0025] The 1st and 2nd lock piece 5 and 6 rotates according to the time of movement of a shift lever 1, when the shift lever 1 is not locked. And the means for returning each piece 5 and 6 to a center valve position from a rotation position is prepared in the end face section of the 1st and 2nd lock piece 5 and 6.
[0026] That is, the hold crevices 9a and 9b which have Openings 8a and 8b are formed by the end face section of the 1st and 2nd lock piece 5 and 6, respectively, and the diameter of the openings 8a and 8b is smaller than the bore of the hold crevices 9a and 9b at it. The guide holes 10a and 10b are formed in the base center section of the hold crevices 9a and 9b, respectively, and the end face section of the support pillars 11a and 11b inserts Openings 8a and 8b and the hold crevices 9a and 9b in the guide holes 10a and 10b, and is loosely inserted in them, respectively. The stoppers 12a and 12b of a major diameter are formed in the support pillars 11a and 11b in hold crevice 9a and 9b rather than Openings 8a and 8b at one, respectively, and it is the spring S1 as an energization means, and S2 between the Stoppers 12a and 12b and base of the hold crevices 9a and 9b. It is prepared, respectively.
[0027] The sliding children 13a and 13b are formed in one at the point of the support pillars 11a and 11b, respectively, and the sliding children 13a and 13b are formed in the Yamagata configuration where the nose of cam was roundish. In addition, the support pillars 11a and 11b, Stoppers 12a and 12b, and the sliding children 13a and 13b are metal. The sliding children's 13a and 13b nose of cam is the center valve position T1 of the bottom of curve wall surface (only henceforth wall surface) 2a of housing 2, and T2 in a usual state. It is in slide contact, it responds to rotation of the 1st and 2nd lock piece 5 and 6, and is the wall surface 2a A spring S1 and S2 The energization force is resisted and it slides. Namely, the center valve position T1 which is the bottom of wall surface 2a and T2 The distance of the end face of the 1st and 2nd lock piece 5 and 6 and wall surface 2a becomes short as the shell sliding children 13a and 13b keep away, and it is a spring S1 and S2. It is compressed. And when rotation of the 1st and 2nd lock piece 5 and 6 stopped, the sliding children 13a and 13b are a spring S1 and S2. By the stored impetus force by compression, it is a center valve position T1 and T2. It returns automatically, respectively.
[0028] Center valve position T1 here The thing of the position in the state where point 5a of the 1st lock piece 5 closed the path of a shift lever 1, and stopper 12a contacted the inner top face of hold crevice 9a is said.
[0029] Moreover, center valve position T2 The thing of the position in the state where point 6a of the 2nd lock piece 6 closed the path of a shift lever 1, and stopper 12b contacted the inner top face of hold crevice 9b is said. And the 1st and 2nd lock piece 5 and 6 is a center valve position T1 and T2. It rocks as a center.
[0030] As shown in drawing 1 - drawing 3 , between the 1st and 2nd lock piece 5 and 6, the solenoid 23 for moving the longitudinal locking bar 22 made of synthetic resin and its longitudinal locking bar 22 as an agonist up and down is formed.
[0031] The longitudinal locking bar 22 is equipped with the support pillar 24, and the support pillar 24 is connected with plunger 23a of a solenoid 23 through the stopper 25. In plunger 23a, it is a spring S3. It has fitted in loosely, as the stopper 25 was contacted. The support pillar 24 is inserted in a solenoid 23, and plunger 23a and the stopper 25 are formed in the wrap covering 27.
[0032] The center section of a substrate 28 is connected with the point of the support pillar 24 at one. The substrate 28 is arranged so that an end may bend, may be formed, the 1st lock piece 5 side may be turned to and the other end may turn to the 2nd 2nd lock piece 6 side. It is formed in perpendicularly a substrate 28 and the pieces 29 and 30 of regulation cross at right angles in the ends of a substrate 28, respectively at one. In the piece 29 of regulation, it is a center valve position T1. It counters with the 1st existing lock piece 5, and contact side 29a (it illustrates to drawing 1) which is parallel mostly with the side of the longitudinal direction is formed. Similarly, in the piece 30 of regulation, it is a center valve position T2. It counters with the 2nd existing lock piece 6, and contact side 30a (it illustrates to drawing 1) which is parallel mostly with the side of the longitudinal direction is formed.
[0033] And when a solenoid 23 is OFF, it is a spring S3. The energization force is resisted, plunger 23a projects, and a stopper 24 contacts the inner top face of covering 27, and upper-** a longitudinal locking bar 22 to a lock position. Movement in the reverse position R of the shift lever 1 which contact side 29a of the piece 29 of regulation and the side of the 1st lock piece 5 counter mutually, and the rotation to the clockwise rotation is regulated by this upper **, for example, is in the neutral position N is regulated. That is, the reverse inhibit mechanism is constituted by the 1st lock piece 5, longitudinal locking bar 22, and solenoid 23.
[0034] Moreover, contact side 30a of the piece 30 of regulation and the side of the 2nd lock piece 6 counter mutually, the rotation to the counterclockwise rotation is regulated, and movement in the reverse position R of the shift lever 1 in the parking position N is regulated. That is, the shift lock mechanism is constituted by the 2nd lock piece 6, longitudinal locking bar 22, and solenoid 23.
[0035] When a solenoid 23 is ON, plunger 23a is a spring S3. According to the stored impetus force, it is absorbed immediately and a longitudinal locking bar 22 is lower-**(ed) to a non-locking position. The pieces 29 and 30 of regulation are caudad located rather than the 1st and 2nd lock piece 5 and 6, and the rotation to the clockwise rotation of the 1st lock

piece 5 and the rotation to the counterclockwise rotation of the 2nd lock piece 6 are permitted by this lower **.
[0036] The solenoid 23 is connected to the control circuit 31 as control means. A control circuit 31 inputs the operating state of the neutral switch 33 switch on when the parking switch 32 switch on when a shift lever 1 is in the parking position P, and a shift lever 1 are in the neutral position N, and carries out on-off control of the solenoid 23. Moreover, a control circuit 31 inputs the operating state of the brake switch 35 switch on when having broken in the detecting signal of the vehicle speed sensor 34 which detects the vehicle speed at the time of an advance run of vehicles (10 or more km/h in this case), and the brake as a braking means which an operator does not illustrate, and carries out on-off control of the solenoid 23.
[0037] Next, an operation of the locking device 4 constituted as mentioned above is explained. In addition, first, a shift lever 1 shall be in the drive position D, and vehicles should start the advance run.
[0038] Based on the input of the vehicle speed detection signal of 10 km/h from the vehicle speed sensor 34, a control circuit 31 controls a solenoid 23 and turns it OFF. Then, plunger 23a is a spring S3. The energization force is resisted and it projects, and a stopper 24 contacts the inner top face of covering 27, and upper-** a longitudinal locking bar 22 to a lock position. At this time, contact side 29a of the piece 29 of regulation and the side of the 1st lock piece 5 have countered mutually, and the rotation to the clockwise rotation of the 1st lock piece 5 is regulated. Therefore, as shown in drawing 1 , even if it is going to move the shift lever 1 in the drive position D to the reverse position R through the neutral position N, a lever 1 is a center valve position T1. The movement is regulated by the 1st existing lock piece 5.
[0039] Next, when it gets into the brake pedal which is not illustrated and vehicles stop, based on the input of the ON state of the brake switch 35, a control circuit 31 controls a solenoid 23 and turns it ON. Then, plunger 23a is a spring S3. According to the stored impetus force, it is absorbed immediately and a longitudinal locking bar 22 is lower-**(ed) to a non-locking position. At this time, the piece 29 of regulation is caudad located rather than the 1st lock piece 5, and the rotation to the clockwise rotation of the 1st lock piece 5 is permitted. Therefore, as shown in drawing 5 , when a shift lever 1 is moved toward the reverse position R from the drive position D, a lever 1 is a center valve position T1. It arrives at the reverse position R, pushing in the 1st existing lock piece 5.
[0040] At this time, the point 5a is in the state which contacted the shift lever 1, and rotates the 1st lock piece 5 to a clockwise rotation focusing on pivot 7a. Setting at the time of this rotation, the nose of cam of sliding child 13a is a center valve position T1. It slides along with shell wall surface 2a, and is a spring S1. It is compressed. And when the shift lever 1 separated from point 5a and rotation of the 1st lock piece 5 stopped, the 1st lock piece 5 and sliding child 13a are a spring S1. It is a center valve position T1 by the stored impetus force. It returns automatically.
[0041] Next, while vehicles are stopping, it does not get into a brake pedal, but the case where a shift lever 1 is in the parking position P is explained. Based on the input of the OFF state of the brake switch 35, and the ON state of the parking switch 32, a control circuit 31 controls a solenoid 23 and turns it OFF. Then, a longitudinal locking bar 22 upper-** to a lock position, and the rotation to the counterclockwise rotation of the 2nd lock piece 6 is regulated by the piece 30 of regulation. Therefore, as shown in drawing 1 , even if it is going to move the shift lever 1 in the parking position P to the reverse position R side, a lever 1 is a center valve position T1. It will be in the lock state which contacted the 1st existing lock piece 5, and the movement will be regulated.
[0042] Then, when it gets into a brake pedal in this state, based on the input of the ON state of the brake switch 35, a control circuit 31 controls a solenoid 23 and turns it ON. Then, a longitudinal locking bar 22 lower-** to a non-locking position, and rotation regulation of the 2nd lock piece 6 by the piece 30 of regulation is canceled. Therefore, as shown in drawing 4 , when a shift lever 1 is moved toward the reverse position R from the parking position P, a lever 1 is a center valve position T2. It arrives at the reverse position R, pushing in the 2nd existing lock piece 6. And when the shift lever 1 separated from point 6a and rotation of the 2nd lock piece 6 stopped, the 2nd lock piece 6 and sliding child 13b are a spring S2. It is a center valve position T2 by the stored impetus force. It returns automatically.
[0043] Moreover, when it does not get into a brake pedal but a shift lever 1 is in the neutral position N, based on the input of the OFF state of the brake switch 35, and the ON state of the neutral switch 33, a control circuit 31 controls a solenoid 23 and turns it OFF. It becomes impossible therefore, to move the shift lever 1 in the neutral position N to the reverse position R side.

[0044] As described above, the 1st and 2nd lock piece 5 and 6 and longitudinal locking bars 22 which regulate movement of a shift lever 1 are separated, and it was made for a longitudinal locking bar 22 to move between a lock position and non-locking positions up and down by the solenoid 23 according to the locking device 4 of this invention. Therefore, a solenoid 23 can obtain operation which moves a longitudinal locking bar 22 up and down and by which the solenoid 23 was stabilized while coming to be sufficient and being able to reduce the load of a solenoid 23.
[0045] Moreover, in case a lock state is canceled and a shift lever 1 moves to the reverse position R from the drive position D, the parking position P, etc., only the 1st and 2nd lock piece 5 and 6 rotates in contact with a shift lever 1. Plunger 23a is compulsorily absorbed by external force, and a solenoid 23 does not have an ON state and a bird clapper, and it becomes unnecessary therefore, to take the endurance in compulsive operation into consideration to a solenoid 23.
[0046] the sliding children 13a and 13b, a spring S1, and S2 etc. -- from -- the 1st after a shift lever 1 moves to the reverse position R with the becoming easy composition, and 2nd lock piece 5 and 6 -- automatic -- a center valve position T1 and T2 It can be made to return. [furthermore,] Moreover, by having made the sliding children 13a and 13b roundish [wore the nose of cam], the sliding friction at the time of sliding on wall surface 2a can decrease, and the 1st and 2nd lock piece 5 and 6 can be rotated smoothly.
[0047] moreover, the composition at the time of the operation of a solenoid 23 since the longitudinal locking bar 22, the 1st, and 2nd lock piece 5 and 6 does not contact mutually in the case of vertical movement of a longitudinal locking bar 22 --

generating of the operation sound of a member can be lessened as much as possible
[0048] Shape may be taken as follows and this example can acquire the same effect as the above-mentioned example also in that case.
(1) making the 1st and 2nd lock piece 5 and 6 rock in the above-mentioned example -- the sliding children 13a and 13b, a spring S1, and S2 etc., although adopted Instead, it corresponds to the both sides and both sides of the end face section of the 1st and 2nd lock piece 5 and 6, and they are the center valve positions T1 and T2 of wall surface 2a. You may prepare elastic members, such as a spring, between the positions which estranged only shell predetermined distance, respectively.
[0049] (2) In the above-mentioned example, although the pieces 29 and 30 of regulation were formed in the ends of a substrate 28 at one, you may form the substrate 28 in one tabular in the form containing the pieces 29 and 30 of regulation. If it does in this way, the intensity to the external force which joins a substrate 28 through the 1st and 2nd lock piece 5 and 6 at the time of movement of a shift lever 1 is fully securable.
[0050] (3) the shift pattern which has a level difference in the above-mentioned example -- the shift pattern of the shape of a straight line which does not have a level difference in an edge although shape was taken to the hole 3 -- a hole and a shift pattern of a mirroring configuration with which each shift position serves as a bilateral symmetry -- you may take shape to a hole etc.
[0051] (4) At the above-mentioned example, they are the drive position D, the position P3 for a 3 steps of advance gear change run, and the position P2 for an advance 2nd speed run. And position P1 for an advance 1st speed run Although set up, it is the position P3 for a 3 steps of advance gear change run. You may lose. Moreover, you may apply this invention to the automatic transmission beyond two-step gear change or four-step gear change.
[0052] (5) If the vehicle speed is proper values other than 10 km/h at all, when it is, you may make it control a solenoid 23 by the above-mentioned example, although a control circuit 31 controls a solenoid 23 and turned it off, when the vehicle speed sensor 34 detected the vehicle speed of 10 or more km/h.
[0053] Invention of those other than the claim which can be grasped from the above-mentioned example is indicated with the effect below. In a locking device according to claim 3, the aforementioned sliding child is characterized by the bird clapper from roundish [wore the nose of cam]. If it does in this way, the sliding friction to a wall surface can be reduced.
[0054]
[Effect of the Invention] as explained in full detail above, while according to this invention simplifying composition and reducing the load of a solenoid, a solenoid operates compulsorily by external force -- there is nothing -- further -- composition -- generating of the operation sound of a member can be lessened as much as possible

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[Translation done.]